

AN20639

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Associated Project: No

Associated Part Family: CY14B256L and STK14C88-3

Associated Application Notes: None

Application Note Abstract

This application note compares the CY14B256L (0.25 μm) and the STK14C88-3 (0.8 μm) devices and presents the results.

Introduction

CY14B256L and STK14C88-3 are both 256K (32K x 8), 3V nvSRAMs in two different technologies, 0.25 μm and 0.8 μm respectively. These parts are functionally similar and can be used in the same applications. However there are differences in parameters, which should be considered when replacing one part with the other.

The specifications in the data sheets of CY14B256L (0.25 μm) and STK14C88-3 (0.8 μm) are compared. [Table 1](#) lists the differences between these two devices. This comparison is not intended to be comprehensive, because there are subtle differences that are not relevant in most applications.

Most applications use autostore and autorecall features of nvSRAM. To simplify the comparison, all electrical parameters which may affect the application performance directly or indirectly are considered. Designers must consider these differences, and if necessary do appropriate changes in their design.

Only those specifications that differ between CY14B256L (0.25 μm) and STK14C88-3 (0.8 μm) nvSRAM are listed in [Table 1](#). These specifications may cause functional issues when replacing one part with the other.

Table 1. Comparison Table

Specification	CY14B256L (35 nsec)		STK14C88-3 (35 nsec)	
Endurance		200,000 cycles		1,000,000 cycles
Retention		20 year		100 year
DC Electrical Characteristics				
V _{cc}	2.7V min	3.6V max	3.0V min	3.6V max
I _{cc1}		55 mA max		52 mA max
I _{cc3}		10 mA max		9 mA max
I _{cc4}		3 mA max		2 mA max
V _{IH}	2.0V min	V _{cc} + 0.3V max	2.2V min	V _{cc} + 0.5V max
V _{cap} ^[1]	17 μF min	120 μF max	68 μF min	220 μF max
C _{in}		7 pF max		5 pF max
AC Switching Characteristics				
t _{OHA}	3 ns min		5 ns min	
t _{LZCE}	3 ns min		5 ns min	
t _{LZWE}	3 ns min		5 ns min	

Note

1. STK14C88-3 applications usually specify the use of 68 μF or 100 μF capacitors, which fall within the range of the CY14B256L device.

Table 1. Comparison Table (continued)

Specification	CY14B256L (35 nsec)		STK14C88-3 (35 nsec)	
Auto Store/Power Up Recall				
$t_{HRECALL}$ [2]		20 ms max		550 μ s max
t_{STORE} [3]		12.5 ms max		10 ms max
V_{SWITCH} [4]	No minimum	2.65V max	2.7V min	2.95V max

Notes

- The power up recall specification is the most dramatic difference between the two devices. To accommodate the much slower specification of the CY14B256L device, system timing modifications may be required.
- Store timing differences are not an issue because it occurs as a background operation when the system is powering down.
- Even though there are small differences here they are unlikely to cause system level problems.

Summary

In most applications you can directly substitute the CY14B256L for the STK14C88-3 nvSRAM.

Document History Page

Document Title: Comparison between CY14B256L and STK14C88-3 nvSRAM

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Revision	ECN No.	Orig. of Change	Submission Date	Description of Change
**	1410463	ZSK	08/23/07	New application note
*A	1639723	ZSK	10/16/07	Changed title
*B	1758963	ZSK	11/19/07	Minor change
*C	2610582	NXR	11/20/08	Changed title. Updated content to reflect change in part number

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